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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,644	06/06/2005	Benjamin A. Haskell	30794.93USWO	5137

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GATES & COOPER LLP  
HOWARD HUGHES CENTER  
6701 CENTER DRIVE WEST, SUITE 1050  
LOS ANGELES, CA 90045

EXAMINER

COLEMAN, WILLIAM D

ART UNIT PAPER NUMBER

2823

DATE MAILED: 04/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/537,644

Applicant(s)

HASKELL ET AL.

Examiner

W. David Coleman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 15 and 17-29 is/are rejected.
- 7) ☒ Claim(s) 14 and 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

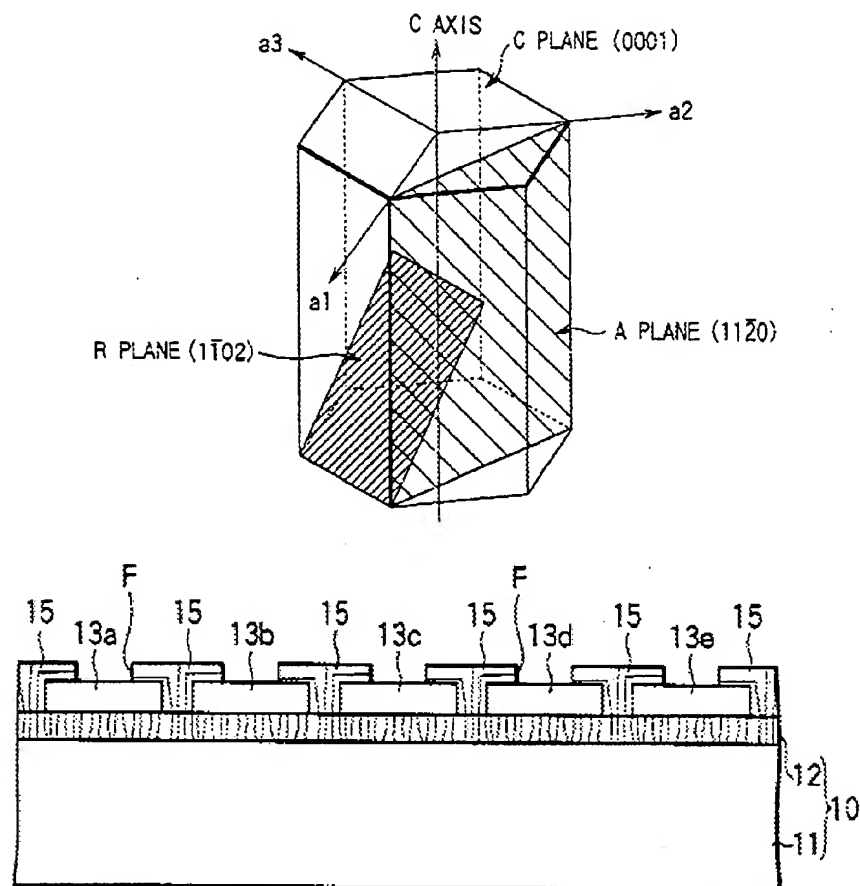
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-13, 15 and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Kiyoku et al., U.S. Patent 6,153,010.

4. Kiyoku teaches a semiconductor method and semiconductor device as claimed. See FIGS. 1A-12, where Kiyoku discloses the following limitations.

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5. Pertaining to claim 1, Kiyoku teaches a method of performing a lateral epitaxial overgrowth of a planar, non-polar, a-plane gallium nitride (GaN) film, comprising:

(a) patterning a mask **13a-13e** deposited on a substrate **11**; and

(b) performing a lateral epitaxial overgrowth of the GaN film off the substrate using hydride vapor phase epitaxy, (column 10, line 42) wherein the GaN film **15** nucleates only on portions of the substrate not covered by the patterned mask, the GaN film grows vertically through openings in the patterned mask, and the GaN film then spreads laterally above the patterned mask and across the substrate's surface.

6. Pertaining to claim 2, Kiyoku teaches the method of claim 1, wherein the lateral epitaxial overgrowth utilizes growth pressures of approximately atmospheric pressure (760 Torr) or below, and a carrier gas containing a fraction of hydrogen (because Kiyoku teaches an epitaxial process, epitaxy is inherently at or below 760 Torr).
7. Pertaining to claim 3, Kiyoku teaches the method of claim 1, wherein the growth pressure is less than 300 Torr (please note that it is well known to perform HVPE in this range see Wong et al., paragraph 0048).
8. Pertaining to claim 4, Kiyoku teaches the method of claim 1, wherein the growth pressure ranges from 5 to 100 Torr.
9. Pertaining to claim 5, Kiyoku teaches the method of claim 1, wherein the carrier gas is predominantly hydrogen (column 10, line 41).
10. Pertaining to claim 6, Kiyoku teaches the method of claim 1, wherein the carrier gas comprises a mixture of hydrogen and nitrogen, argon, or helium (see column 10, line 41, please note that ammonia gas is made up of nitrogen and hydrogen gas).
11. Pertaining to claim 7, Kiyoku teaches the method of claim 1, wherein the lateral epitaxial overgrowth reduces threading dislocation densities in the GaN film (column 9, lines 52-53).

12. Pertaining to claim 8, Kiyoku teaches the method of claim 1, wherein the substrate comprises sapphire (column 9, line 6-7).

13. Pertaining to claim 9, Kiyoku teaches the method of claim 1, wherein the patterned mask is comprised of a metallic material (column 8, lines 11).

14. Pertaining to claim 10, Kiyoku teaches the method of claim 1, wherein the patterned mask is comprised of a dielectric material (column 8, line 8).

15. Pertaining to claim 11, Kiyoku teaches the method of claim 1, wherein the patterned mask is a silicon dioxide (SiO<sub>2</sub>) mask containing apertures or stripes allowing access to the substrate underlying the mask (see **FIG. 4**)

16. Pertaining to claim 12, Kiyoku teaches the method of claim 1, wherein the patterning step comprises: depositing a silicon dioxide (SiO<sub>2</sub>) film on the substrate; patterning a photoresist layer on the silicon dioxide film; etching away any portions of the silicon dioxide film exposed by the patterned photoresist layer; removing remaining portions of the photoresist layer; and cleaning the substrate (the Examiner takes the position that it is well known that a photomask is patterned with photoresist, see column 8, lines 1-33)).

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17. Pertaining to claim 13, Kiyoku teaches the method of claim 1, wherein the substrate is coated with a template layer of GaN, aluminum nitride (AlN), aluminum gallium nitride (AlGaN), or other thin film (see **FIG. 6C**).

18. Pertaining to claim 15, Kiyoku teaches the method of claim 1, wherein the substrate is coated with a nucleation layer deposited at either low temperatures or at the growth temperature (please note that because the term “low” provides no definite meaning, any temperature disclosed by Kiyoku meets this limitation).

19. Pertaining to claim 17, Kiyoku teaches a device manufactured using the method of claim 1.

20. Pertaining to claim 18, Kiyoku teaches the device of claim 17, wherein the device is a laser diode, light-emitting diode or transistor (See **FIG. 12**).

21. Pertaining to claim 19, Kiyoku teaches a lateral epitaxial overgrowth of a planar, non-polar, a-plane gallium nitride (GaN) film off a substrate, wherein the lateral epitaxial overgrowth is created using a process comprising:

(a) patterning a dielectric mask **13** deposited on a substrate **11**; and

(b) performing a lateral epitaxial overgrowth of the GaN film off the substrate using hydride vapor phase epitaxy, wherein the GaN film nucleates only on portions of the substrate exposed by the patterned dielectric mask, the GaN film grows vertically through openings in the patterned dielectric mask, and the GaN film then spreads laterally above the patterned dielectric mask and across the substrate's surface.

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*Objections*

22. Claims 14 and 16 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Conclusion*

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. David Coleman whose telephone number is 571-272-1856. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:30 PM.

24. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

25. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



W. David Coleman  
Primary Examiner  
Art Unit 2823

WDC